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EXAMINER

STAICOVICI, STEFAN

ART UNIT PAPER NUMBER

1732

DATE MAILED: 08/26/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/913,889

Applicant(s)

SEKIDO ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14-35 is/are pending in the application.
- 4a) Of the above claim(s) 18-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-17, 34-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed June 5, 2003 (paper No. 8) has been entered. Claims 1 and 2 have been amended. No claims have been canceled. No claims have been added.

Claims 1-12 and 14-35 are pending in the instant application.

Election/Restrictions

2. Applicant's election without traverse of Group I in Paper No. 8 is acknowledged.

Claims 18-33 remain withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claims 1-12, 14-17 and 34-35 are prosecuted in the instant application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In dependent claim 12, the limitation that the core is separated from the tubular body is in direct conflict with the limitation

of independent claim 1, upon which it depends, that an integral tubular object is formed, said integral tubular object including a tubular core, a fiber fiber-reinforced plastic layer and a resin distribution medium. It is submitted that an "integral" tubular object including a tubular core, a fiber fiber-reinforced plastic layer and a resin distribution medium cannot have a core that is separated from the tubular body. Further clarification is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 10-11, 14 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekido *et al.* (US Patent No. 5,960,834) in view of Tunis, III *et al.* (US Patent No. 6,159,414).

Sekido *et al.* ('834) teach the basic claimed process of forming a tubular fiber reinforced article including, providing an expansive tubular mandrel (1) (tubular core), wrapping a layer of fibers (2) and a layer of woven fabric (5) about said mandrel (1) to form a wrapped assembly, placing said wrapped assembly in an air-tight mold (covering), drawing a vacuum onto the interior of said mold, injecting a resin into said mold to impregnate said assembly and curing said assembly to form said tubular fiber reinforced article (see Figure 1 and col. 21, line 21 through col. 22, line 5).

Regarding claim 1, Sekido *et al.* ('834) do not teach a resin distribution medium. Tunis, III *et al.* ('414) teach the claimed process of making a fiber reinforced tubular body including, arranging a resin distribution medium (64) and a fiber reinforced layer (66) about a core (60) to form a wrapped assembly, covering said wrapped assembly with an airtight covering (68), drawing a vacuum and injecting a resin through said distribution resin medium (64) to impregnate said fiber reinforced layer (66) and produce said fiber reinforced tubular body (see Figures 6 and 7 and, col. 6, lines 18-44). Further, it should be noted that since Tunis, III *et al.* ('414) teach that the "the fiber material may be supplied in a tubular form into which the core is inserted" (see col. 4, lines 21-22), it is submitted that a fiber reinforced tubular plastic body results and that a tubular core is used. Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin distribution medium as taught by Tunis, III *et al.* ('414) in the process of Sekido *et al.* ('834) because, Tunis, III *et al.* ('414) specifically teach that a resin distribution medium provides for uniform impregnation and as such improved shear strength of the resulting article (see col. 2, lines 40-55).

In regard to claims 2-4, Tunis, III *et al.* ('414) teach a resin distribution system including large longitudinal groove (14) and a plurality of transversal, smaller grooves (18) (see Figure 1) and a reticulate material (see Figure 6). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin distribution medium as taught by Tunis, III *et al.* ('414) in the process of Sekido *et al.* ('834) because, Tunis, III *et al.* ('414) specifically teach that a resin distribution medium provides for uniform impregnation and as such improved shear strength of the resulting article (see col. 2, lines 40-55).

Specifically regarding claim 5, Tunis, III *et al.* ('414) teach a fiber reinforced layer (64) positioned between a resin distribution medium (150) and a core material (60) having resin distribution grooves (see col. 9, lines 18-30). Hence, it is submitted that Tunis, III *et al.* ('414) teach the use of both a reticulate resin distribution medium (150) and resin distribution grooves. Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin distribution medium (reticulate and grooves) as taught by Tunis, III *et al.* ('414) in the process of Sekido *et al.* ('834) because, Tunis, III *et al.* ('414) specifically teach that a resin distribution medium provides for uniform impregnation and as such improved shear strength of the resulting article (see col. 2, lines 40-55).

Specifically regarding claim 10, since Tunis, III *et al.* ('414) teach a resin distribution system including large longitudinal groove (14) and a plurality of transversal, smaller grooves (18) (see Figure 1) and a process including drawing a vacuum which forces a resin material to travel through said grooves, it is submitted that said large longitudinal groove also serves as a vacuum suction line in order for the invention of Tunis, III *et al.* ('414) to function as described. Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin distribution medium that acts as a vacuum channel as taught by Tunis, III *et al.* ('414) in the process of Sekido *et al.* ('834) because, Tunis, III *et al.* ('414) specifically teach that a resin distribution medium provides for uniform impregnation and as such improved shear strength of the resulting article (see col. 2, lines 40-55).

Regarding claim 11 Sekido *et al.* ('834) teach wrapping a layer of fibers (2) and a layer of woven fabric (5) about said mandrel (1).

In regard to claims 14 and 35, Sekido *et al.* ('834) teach applying an internal pressure to expansive tubular mandrel (1). Further, Sekido *et al.* ('834) teach a process for making a curved tubular fiber reinforced plastic body, specifically a tennis racket having a curved portion (frame) and a straight portion (handle) (see Figure 33).

Specifically regarding claim 34, Sekido *et al.* ('834) teaches a woven fabric (5). Further, it is submitted that wrapping occurs with a degree of tension in order to maintain the fiber reinforced layers about said cores and as such in order for the invention of Sekido *et al.* ('834) in view of Tunis, III *et al.* ('414) to function as described.

7. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekido *et al.* (US Patent No. 5,960,834) in view of Tunis, III *et al.* (US Patent No. 6,159,414) and in further view of McClure *et al.* (US Patent No. 6,090,335).

Sekido *et al.* ('834) in view of Tunis, III *et al.* ('414) teach the basic claimed process as described above.

Regarding claim 6, Sekido *et al.* ('834) in view of Tunis, III *et al.* ('414) do not teach a lengthwise lowermost resin line and an upper most vacuum line in regard to the resin distribution medium. McClure *et al.* ('335) teach a vacuum resin impregnation process including providing a fiber reinforced layer covered by an air-tight vacuum bag, an uppermost vacuum line (30) and a plurality of lowermost resin lines (40), such that as a vacuum is drawn across the inside of the vacuum bag resin is pulled through the fiber reinforced layer (see Figure 2). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a lowermost resin line and an upper most vacuum line as taught by McClure *et al.* ('335) because, McClure *et al.* ('335)

specifically teach that such an arrangement provides for resin flow to occur when a vacuum is drawn over the interior of a mold, whereas Sekido *et al.* ('834) teach a mold impregnation process requiring a vacuum be formed while a resin is being distributed, hence in order for the invention of Sekido *et al.* ('834) in view of Tunis, III *et al.* ('414) to function as described.

In regard to claims 7-9, Sekido *et al.* ('834) teach a plurality of resin lines. Further, Sekido *et al.* ('834) teach that the number and position of the resin lines can be used to optimize the molding conditions and that the resin line and the vacuum line are interchangeable (see col. 23, line 61 through col. 24, line 4). It is submitted that the number and position of the resin and vacuum lines is a mere result-effective variable. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine the number and position of the vacuum and resin lines in the process of Sekido *et al.* ('834) in view of Tunis, III *et al.* ('414) and in further view of McClure *et al.* ('335) because, Sekido *et al.* ('834) specifically teach that the number and position of the resin lines can be used to optimize the molding conditions.

8. Claims 1-5, 10-11 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tunis, III *et al.* (US Patent No. 6,159,414) in view of Sekido *et al.* (US Patent No. 5,960,834).

Tunis, III *et al.* ('414) teach the claimed process of making a fiber reinforced body including, arranging a resin distribution medium (64) and a fiber reinforced layer (66) about a tubular core (60) (see Figures 14 and 16A) to form a wrapped assembly, covering said wrapped assembly with an airtight covering (68), drawing a vacuum and injecting a resin through said distribution resin medium (64) to impregnate said fiber reinforced layer (66) and produce said

fiber reinforced body (see Figures 6 and 7 and, col. 6, lines 18-44). Further, it should be noted that since Tunis, III *et al.* ('414) teach that the "the fiber material may be supplied in a tubular form into which the core is inserted" (see col. 4, lines 21-22), it is submitted that a fiber reinforced tubular plastic body results (see also Figure 16A).

Regarding claim 1, although Tunis, III *et al.* ('414) teach that "the fiber material may be supplied in a tubular form into which the core is inserted" (see col. 4, lines 21-22), Tunis, III *et al.* ('414) do not specifically teach a tubular fiber reinforced object. Sekido *et al.* ('834) teach a process of forming a tubular fiber reinforced article including, providing an expansive tubular mandrel (1) (tubular core), wrapping a layer of fibers (2) and a layer of woven fabric (5) about said mandrel (1) to form a wrapped assembly, placing said wrapped assembly in an air-tight mold (covering), drawing a vacuum onto the interior of said mold, injecting a resin into said mold to impregnate said assembly and curing said assembly to form said tubular fiber reinforced article (see Figure 1 and col. 21, line 21 through col. 22, line 5). Therefore, it would have been obvious for one of ordinary skill in the art to have formed a tubular fiber reinforced object as taught by Sekido *et al.* ('834) using the process of Tunis, III *et al.* ('414) because Tunis, III *et al.* ('414) specifically suggests teach that "the fiber material may be supplied in a tubular form into which the core is inserted" and also because both references teach similar materials and processes.

In regard to claims 2-4, Tunis, III *et al.* ('414) teach a resin distribution system including a large longitudinal groove (14) and a plurality of transversal, smaller grooves (18) (see Figure 1) and a reticulate material (see Figure 6) (see col. 2, lines 40-55).

Specifically regarding claim 5, Tunis, III *et al.* ('414) teach a fiber reinforced layer (64) positioned between a resin distribution medium (150) and a core material (60) having resin distribution grooves (see col. 9, lines 18-30). Hence, it is submitted that Tunis, III *et al.* ('414) teach the use of both a reticulate resin distribution medium (150) and resin distribution grooves.

Specifically regarding claim 10, since Tunis, III *et al.* ('414) teach a resin distribution system including large longitudinal groove (14) and a plurality of transversal, smaller grooves (18) (see Figure 1) and a process including drawing a vacuum which forces a resin material to travel through said grooves, it is submitted that said large longitudinal groove also serves as a vacuum suction line in order for the invention of Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) to function as described.

Regarding claim 11 Sekido *et al.* ('834) teach wrapping a layer of fibers (2) and a layer of woven fabric (5) about said mandrel (1). Therefore, it would have been obvious for one of ordinary skill in the art to have formed a tubular fiber reinforced object as taught by Sekido *et al.* ('834) using the process of Tunis, III *et al.* ('414) because Tunis, III *et al.* ('414) specifically suggests teach that "the fiber material may be supplied in a tubular form into which the core is inserted" and also because both references teach similar materials and processes.

In regard to claims 15-16 and 34, Tunis, III *et al.* ('414) teach wrapping said fiber reinforcement layers (66) around a plurality of tubular cores and integrating said wrapped separate cores into an integral boat hull (circumferential direction). Further regarding claim 34, Sekido *et al.* ('834) teaches a woven fabric (5). It is submitted that wrapping occurs with a degree of tension in order to maintain the fiber reinforced layers about said cores and as such in

order for the invention of Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) to function as described. Further, it should be noted that Tunis, III *et al.* ('414) specifically teach that the cores may take any shape and be arranged in any suitable pattern, hence a circumferential pattern, since a boat hull is fabricated.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tunis, III *et al.* (US Patent No. 6,159,414) in view of Sekido *et al.* (US Patent No. 5,960,834 and in further view of Nakamura (US Patent No. 6,350,337 B1).

Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) teach the basic claimed process as described above.

Regarding claim 17, Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) do not teach a connecting member. However, the use of connecting members to form a complex shaped article is well known the art as evidenced by Nakamura ('337) that teaches a process for molding tubular fiber reinforced articles including a plurality of cores wrapped with fiber reinforced material, placing said wrapped cores into a mold, injecting resin into said mold and curing said resin to form a tubular fiber reinforced article, wherein said plurality of cores are connected by connecting members (122) (see Figure 14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided connecting members to connect a plurality of cores as taught by Nakamura ('337) in the process of Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) due to a variety of advantages such as increased versatility by obtaining complex shapes and also because Tunis, III *et al.* ('414) specifically teach molding a plurality of tubular cores

into an integral article, whereas Nakamura ('337) teach connecting a plurality of cores in order to obtain a complex molded shape.

10. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tunis, III *et al.* (US Patent No. 6,159,414) in view of Sekido *et al.* (US Patent No. 5,960,834 and in further view of McClure *et al.* (US Patent No. 6,090,335).

Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) teach the basic claimed process as described above.

Regarding claim 6, Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) do not teach a lengthwise lowermost resin line and an upper most vacuum line in regard to the resin distribution medium. McClure *et al.* ('335) teach a vacuum resin impregnation process including providing a fiber reinforced layer covered by an air-tight vacuum bag, an uppermost vacuum line (30) and a plurality of lowermost resin lines (40), such that as a vacuum is drawn across the inside of the vacuum bag resin is pulled through the fiber reinforced layer (see Figure 2). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a lowermost resin line and an upper most vacuum line as taught by McClure *et al.* ('335) in the process of Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) because, McClure *et al.* ('335) specifically teach that such an arrangement provides for resin flow to occur when a vacuum is drawn over the interior of a mold, whereas Sekido *et al.* ('834) teach a mold impregnation process requiring a vacuum be formed while a resin is being distributed, hence in order for the invention of Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) to function as described.

In regard to claims 7-9, Sekido *et al.* ('834) teach a plurality of resin lines. Further, Sekido *et al.* ('834) teach that the number and position of the resin lines can be used to optimize the molding conditions and that the resin line and the vacuum line are interchangeable (see col. 23, line 61 through col. 24, line 4). It is submitted that the number and position of the resin and vacuum lines is a mere result-effective variable. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine the number and position of the vacuum and resin lines in the process of Tunis, III *et al.* ('414) in view of Sekido *et al.* ('834) and in further view of McClure *et al.* ('335) because, Sekido *et al.* ('834) specifically teach that the number and position of the resin lines can be used to optimize the molding conditions.

Response to Arguments

11. Applicants' remarks filed June 5, 2003 (Paper No. 8) have been considered.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached at (703) 305-5493. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD


Primary Examiner 8/25/03

AU 1732

August 25, 2003